VAPE
Virtual observatory Aided Publishing for Education
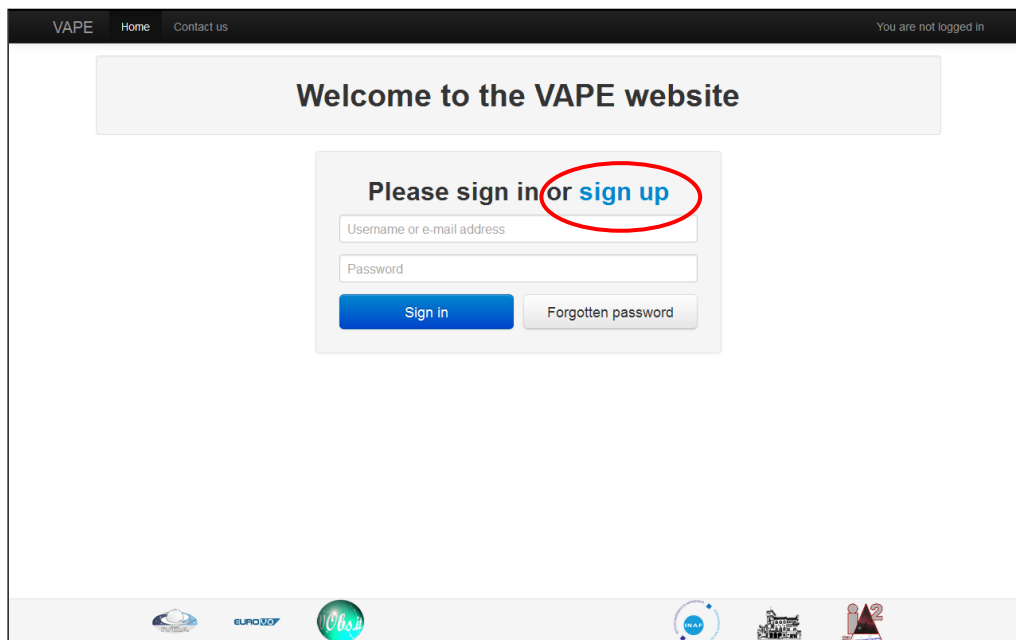G. Iafrate, M. Molinaro, F. Cepparo, M. Ramella

http://ia2-edu.oats.inaf.it:8080/vape

VAPE is an application for the publication of educational data in the Virtual Observatory (VO). VAPE has been developed by IA2 (http://ia2.oats.inaf.it). Thanks to VAPE, institutes managing educational telescopes can publish their data in the VO without facing the complexity of (more complete) professional tools. The creation of an educational data archive will a) provide teachers performing observations with an educational telescope to easily store and access their observations, b) make observations available to teachers that have otherwise no access to a telescope. An added advantage of the publication in VO is the availability of many free tools for displaying and/or analyzing data.

The main steps for the service generation and data publication are: a) user (institute) registration, b) telescope(s) and instrument(s) registration, c) insertion of the information about the service to be linked to the telescope and d) the submission of a test file. After service generation it will be possible to proceed with image publication and data querying through VO tools.

Step 1: **Register the institute** (e.g. Astronomical Observatory of ...) through *sign up.*

Insert the requested information in the registration window. Attention: the *username* can not be modified.

Send the information and wait for the confirmation e-mail. After having received the confirmation e-mail, you may sign-in for the first time.

By clicking on the username in the top right corner of the window you will open the *User administrator page*, where you will be able to modify/save your own data.

Step 2: **add a new telescope**. In the VAPE main window select _Add new telescope_.
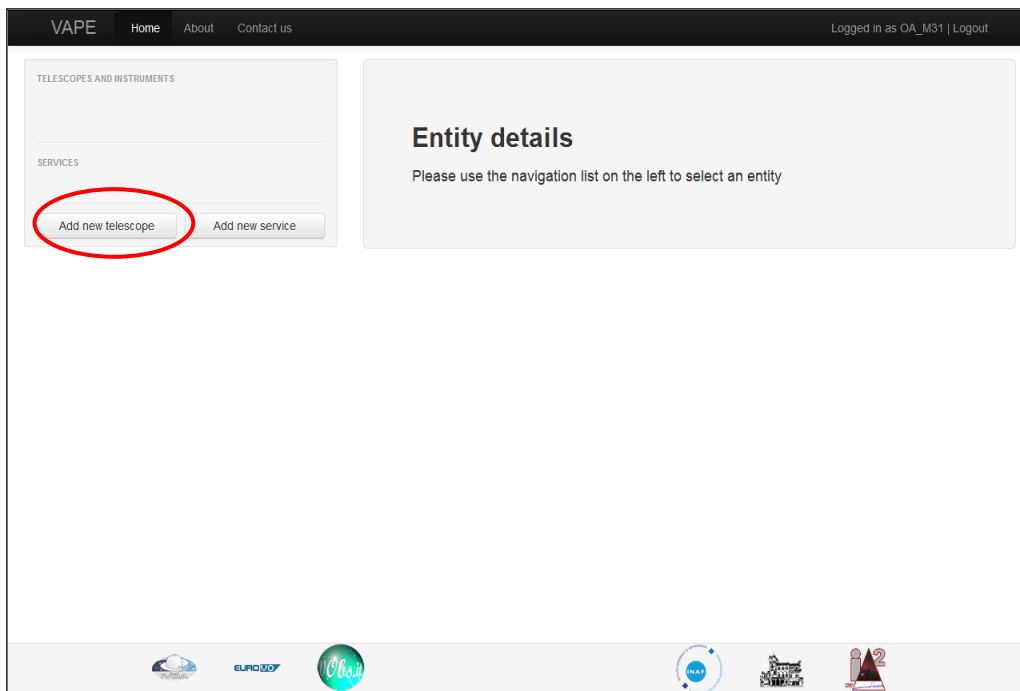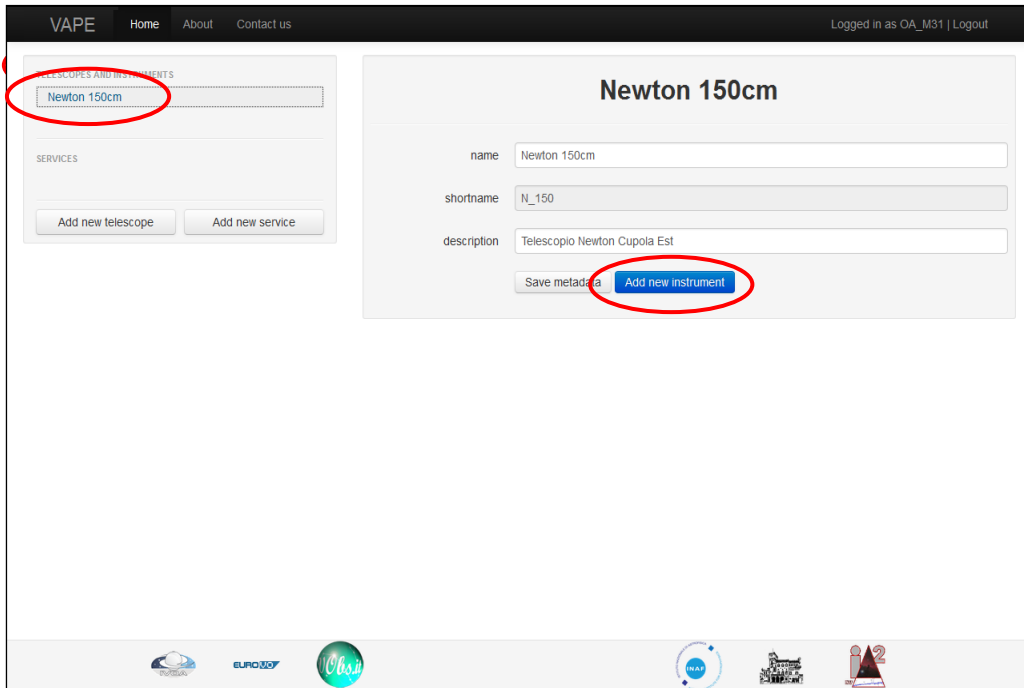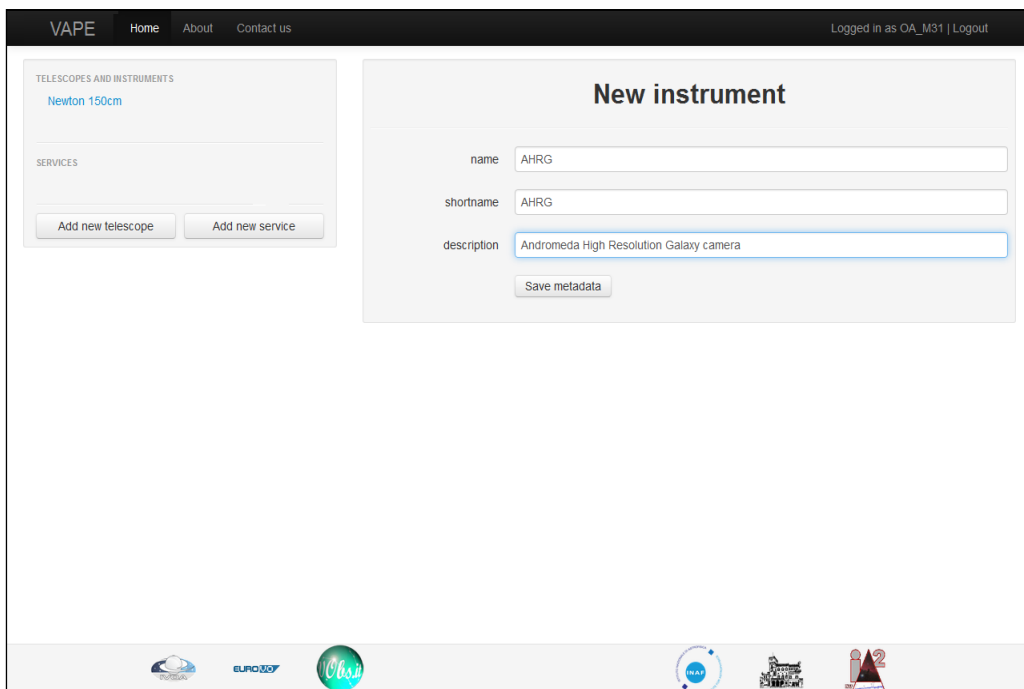

Insert the requested information. Attention: the _shortname_ can not be modified.
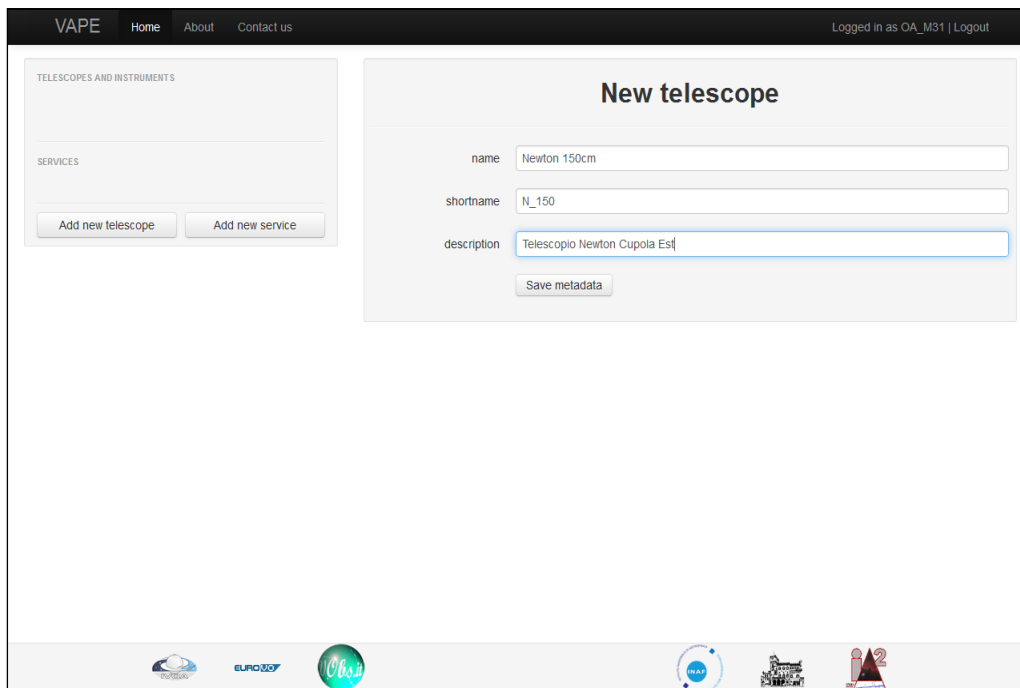
Step 3: **add a new instrument**. A telescope can have more than one instrument, e.g. a camera for imaging and a spectrograph. The telescope created in step 2 appears in the left column of VAPE, by selecting it, it is possible to add a new instrument through _Add new instrument_.

Insert the requested information and save them through *Save metadata*. Attention: the *shortname* can not be modified.

At the end a window with the confirmation of the instrument addition appears.
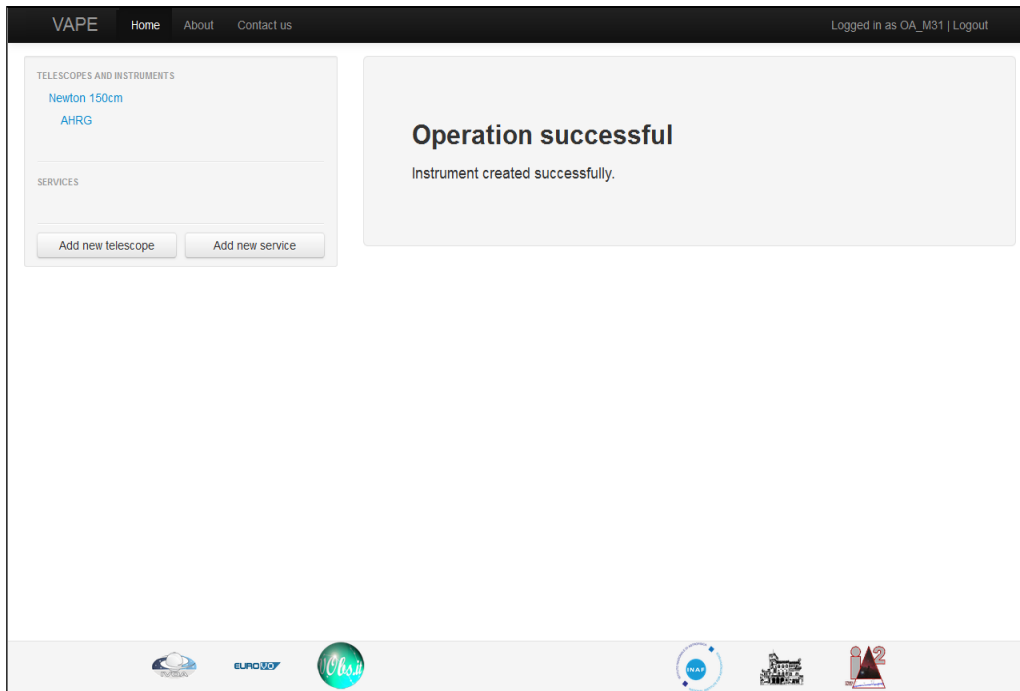
Step 4: **setting up the service**. In the left column select *Add new service* and insert the requested information.

- *VO Title*: title of the service, with clear references to institute, telescope, instrument, aim (educational), etc;
- *VAPE Shortname* and VO *Shortname* can be the same;
- *VO Description*: detailed description of the educational activity, with information on methods, instruments, user (students, teachers, …), etc.;
- *protocolType*: at the moment only SIAP (simple image access protocol) is available, in the future SSAP (simple spectra access protocol) will be added;
- *VO Subject*: some keywords of the service, separated by "#";
- *VO ReferenceUrl*: web site with the description of the educational activity.

Save the information by clicking on *Save metadata*. VAPE moves to the next window where a test FITS file is requested in order to proceed with the service creation.

At this point you have to verify that your FITS files are acceptable for publication in the VO through VAPE and, if not, to modify them according to the rules below:

1) verify with FITS Verify (http://fits.gsfc.nasa.gov/fits_verify.html) that files fit the standards of FITS format
2) if the following keywords are not already present, insert them in the FITS header
     OBJECT   observed object
     OBJ_TYPE   object type: "*astro*" for stars, deep sky, etc; "*sun*" for the Sun; "*planetary*" for the Solar System objects

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OBSERVER	observer (you or the class)
TELESCOP	telescope used for observations – this keyword must match the telescope *shortname* previously inserted in VAPE
INSTRUME	instrument used for observations – this keyword must match the instrument *shortname* previously inserted in VAPE and linked to the service
INSTITUT	institute performing the observations
PURPOSE	"*edu*" in order to tag observations as educational

Once your FITS files satisfy the above requirements, you may proceed uploading the test file. Specify for each of the following variables RA, DEC, Date, Image ID and Pixel Scale the corresponding keyword of your file header. If needed modify the information using arithmetical operations and/or constants.

Tips&Tricks: in order to perform arithmetical operations insert the desired function (from the list menu *functions*) and then insert inside it the keywords (from the list menu *Fits keys*) and/or the constants (from the list menu *Constant*). To delete a field use *Undo.*


At the end save the metadata: a confirmation page appears. An email message will confirm the activation of the service.

Step 5: **upload the images to be published**. Select your service in the VAPE main window. A window will pop-up where you will be able to modify title, description, keywords and reference web site of the service. In order to upload new images select *Upload new files*.
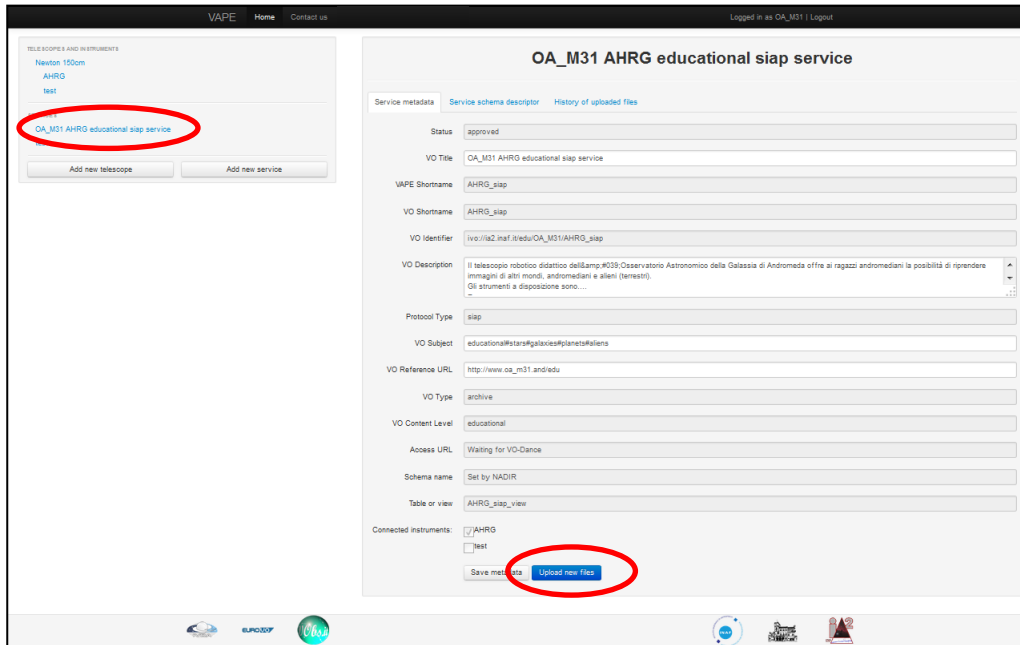
A pop-up window will confirm the end of the upload procedure.
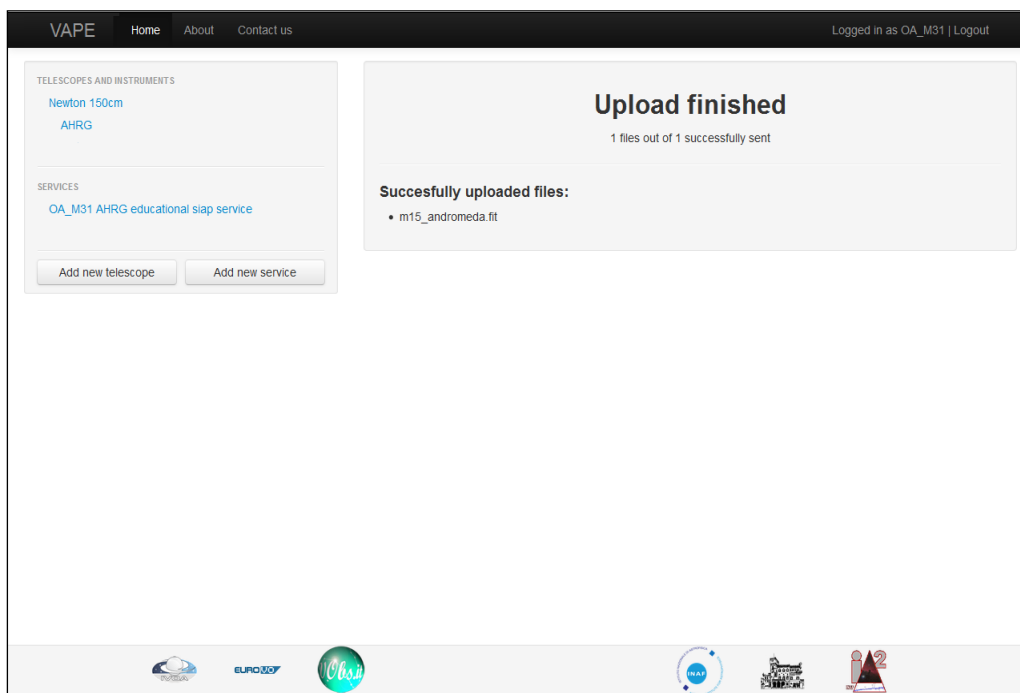
During the upload, files are renamed according to the schema OBJECT_OBS_DATE.fits and a new keyword with the original file name is added to the file header.

N.B.: when a service is approved its state changes from *requested* to *approved.* Even if approved by VAPE, the service has to be registered in the VO registries before images become available in the VO. Wait until the URL appears in the field *accessURL*.

Step 6: **access the images**. Images published with VAPE enter the Virtual Observatory – VO (http://www.euro-vo.org) and are accessible through VO tools, e.g. Aladin (free download from http://aladin.u-strasbg.fr).

Some examples on how to use Aladin for educational purposes are available on the web site http://wwwas.oats.inaf.it in the download section.

How to access the images of a specific service (e.g. SVAS of INAF OATs) using Aladin:

Open Aladin

*File -> Load astronomical image -> Aladin image server*

Select the *all_VO* tab and insert in the field *Object* the name or the coordinates of the object you want to search for.
In order to get all images published by a specific service insert *0:0:0 0:0:0* in the field *Object* and *180°* in the field *Radius*.
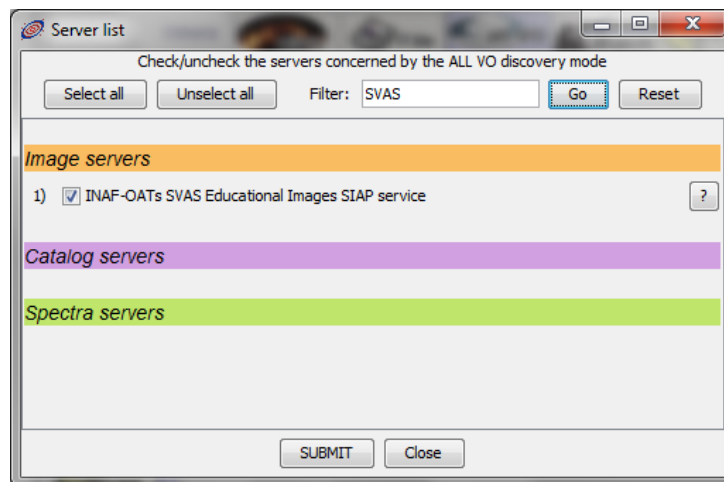
Select *Images* only (deselect *Catalogs* and *Spectra*) and open the *Detailed list.*
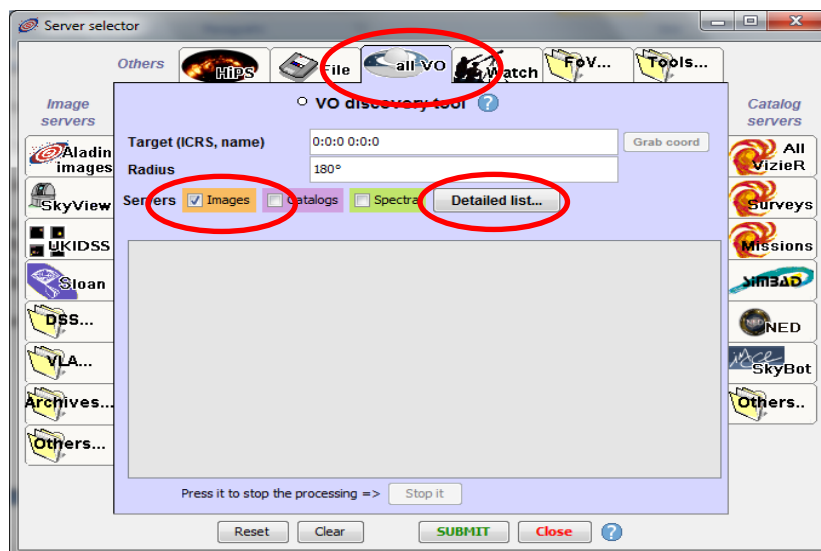
A window with the list of all available services which have images of the searched object appears.
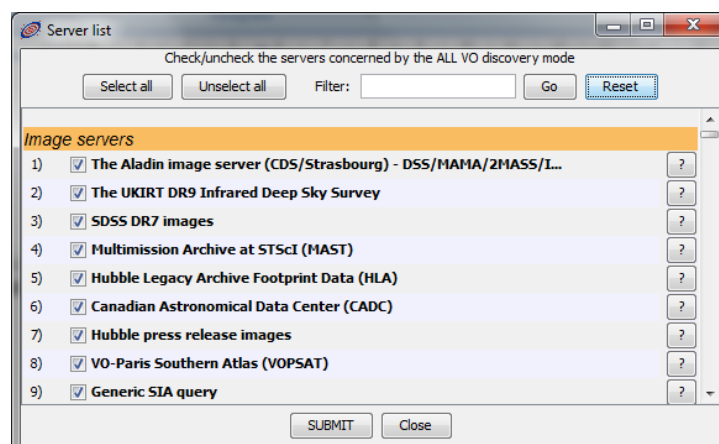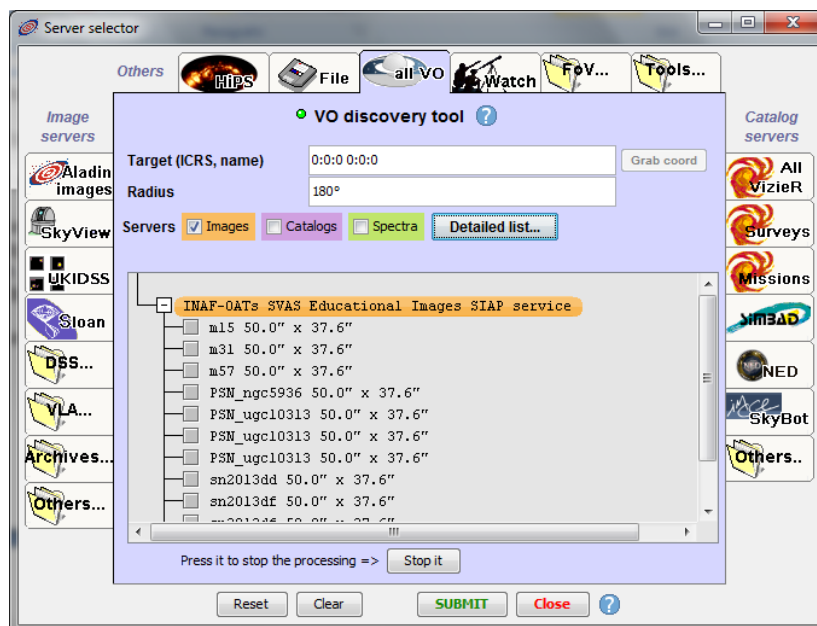
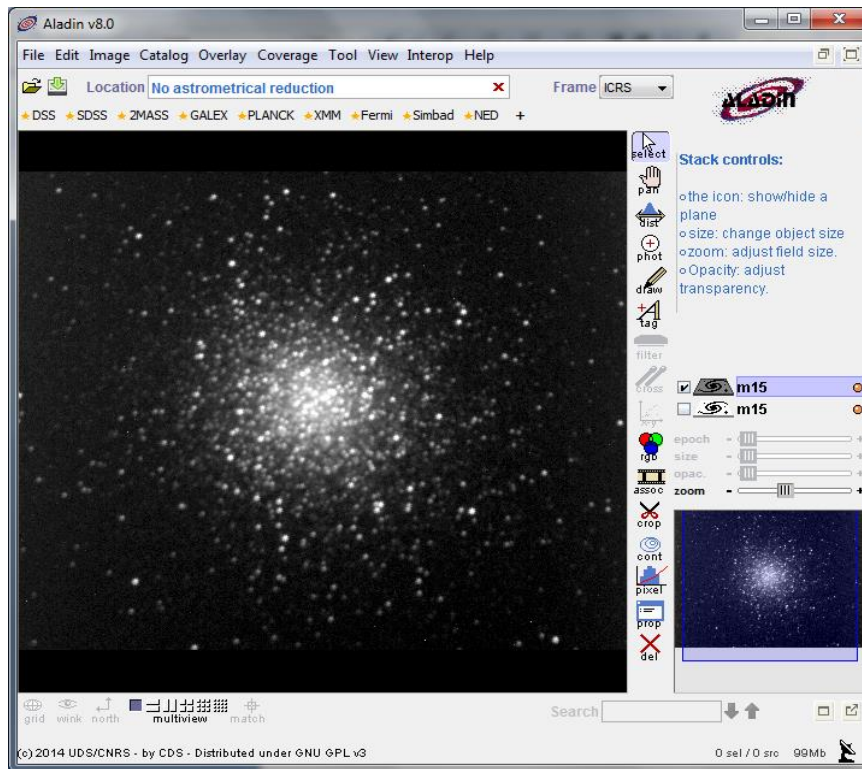Insert the name (or a part of it) of the desired service (i.e. SVAS) in the field *Filter* and click *Go*.

The botton "?" shows the information about that service inserted in VAPE. Select the service, submit and close the window.

The list of images provided by the selected service appears in the server selector window.

Double click on a image name in order to visualize the information saved in the file header. Select an image and submit to load it in Aladin.

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